Socio-economic and productive reality of blackberry no thorn farmers in the state of Risaralda

Realidad socioeconómica y productiva de agricultores de mora sin espina en el departamento de Risaralda

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Abstract

The participatory research with farmers was carried out in order to know the socioeconomic and productive reality of blackberry farmers no thorn (*Rubus glaucus Benth*) from seven cities in the state of Risaralda, taking into account the technological

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demands of the crop. It was carried out with 328 producers, grouped into 40 subgroups, participatory methodologies were used such as Participatory Rural Diagnosis, appraisals, direct and participant observation, interviews and semistructured dialogues, group discussions and analysis, information output matrices, ideas for group reflection, talking maps, analysis of qualifications and scores, comparison of opinion groups, workshops, semi-structured interviews, field days, participatory research plots and field transects, from an on-demand research scheme. It was found that the cultivation of blackberry no thorn in Risaralda is 90% of peasant agriculture, it is carried out in plots of between 0,5 to 1 hectare, under the modalities of ownership, sharecropping and leasing, 30% are tenants, hand the work is family-oriented and the tasks are classified by gender and age; one hectare produces 8.5 t / year and generates 2,5 minimum wages. 27 variables were analyzed that allowed to identify the strengths, limitations, opportunities and risks of the crop in the technical, economic, social, cultural, environmental and commercial components. The strengths identified were quality of the seed and the product, cultural work and GAP, adequate use of protection kits and permitted chemical inputs, family labor, revolving fund and savings and land tenure. The main limitations were pests and diseases, inappropriate use of pesticides and infrastructure in terms of cold rooms; The opportunities described had to do with access to training and implementation of GAP, technical support and support from the Ministry of agriculture, processing, post-harvest management, product transformation, certifications, crop records, integrations between partners and the family, support from institutions and better living conditions for producers and their families; access to education, decent housing, social security and health; The risks identified were climatic factors, low prices in commercialization, high costs of inputs and low sales prices. Planting and the establishment of a tutored system are the most important cultural tasks for blackberry producers, in the same way they mention 35 important insects during the entire production cycle and the diseases Crespera, Anthracnose, Downy mildew and gray

mold as the most limiting. Participatory research with farmers turned out to be a useful and versatile strategy for conducting research on demand. The exchange and collaboration with the farmers allowed not only to know the reality of the cultivation of blackberry without thorn in its different dimensions, but also to carry out field trials with research plots

Keywords: Rubus glaucus, Participatory research, Participatory Rural Diagnosis

Resumen

La investigación participativa con agricultores (IPA) se hizo con el fin de conocer la realidad socioeconómica y productiva de agricultores de mora sin tuna (*Rubus glaucus Benth*) de siete municipios del departamento de Risaralda, teniendo en cuenta las demandas tecnológicas del cultivo. Se realizó con 328 productores, agrupados en 40 núcleos o subgrupos, se utilizaron metodologías participativas como Diagnóstico Rural Participativo (DRP), avalúos, observación directa y participante, entrevistas y diálogos semi-estructurados, discusiones y análisis grupales, matrices de salida de información, ideas para la reflexión grupal, mapas parlantes, análisis de calificaciones y puntajes, comparación de grupos de opinión, talleres, entrevistas semiestructuradas, días de campo, parcelas de investigación participativa y transectos en campo, desde un esquema de investigación por demanda. Se encontró que el cultivo de mora sin espina en Risaralda es un 90% de agricultura campesina, se realiza en predios de entre 0,5 a 1 hectárea, bajo las modalidades de propiedad, aparcería y arrendamiento, el 30% son arrendatarios, la mano de obra es familiar y las labores se clasifican por género y edad; una hectárea produce 8,5 t/año y genera 2,5 salarios mínimos. Se analizaron 27 variables que permitieron identificar las fortalezas, limitaciones, oportunidades y riesgos del cultivo en los componentes técnico, económico, social, cultural, ambiental y comercial. Las fortalezas identificadas fueron calidad de la semilla y el producto, labores

culturales y BPA, utilización adecuada de los kits de protección e insumos químicos permitidos, mano de obra familiar, fondo rotatorio y de ahorro y tenencia de la tierra. Las principales limitaciones fueron plagas y enfermedades, uso inadecuado de agrotóxicos e infraestructura en cuanto a cuartos fríos; las oportunidades descritas tuvieron que ver con acceso a capacitaciones e implementación de BPA, acompañamiento técnico y apoyo del MADR, procesamiento, manejo post-cosecha, transformación del producto, certificaciones, registros del cultivo, integraciones entre socios y la familia, apoyo de instituciones y mejores condiciones de vida para los productores y sus familias; acceso a educación, vivienda digna, seguridad social y salud; los riesgos identificados fueron factores climáticos, bajos precios en la comercialización, altos costos de los insumos y bajos precios de venta. La siembra y el establecimiento de sistema de tutorados son las labores culturales más importantes para los productores de mora, de igual manera mencionan 35 insectos de importancia durante todo el ciclo de produccion y las enfermedades Crespera, Antracnosis, Mildeo velloso y moho gris como las más limitantes. La investigación participativa con agricultores resulto ser una estrategia útil y versátil para realizar investigación por demanda. El intercambio y colaboración con los agricultores permitió no solo conocer la realidad del cultivo de mora sin espina en sus diferentes dimensiones, sino también, llevar a cabo ensayos en campo con parcelas de investigación.

Palabras Clave: *Rubus glaucus***,** Investigación participativa, Diagnóstico Rural Participativo.

1. Introduction

Participatory Research is a collaborative work model between researchers and farmers whose purpose is, among others, the transfer and / or adoption of technology that allows farmers to take the role of researchers: testing, collecting data, analyzing and determining information. It is a tool that is used, among other

reasons, to quickly prioritize the problems of a community, with its use it is possible for producers to solve the technological problems that limit their agricultural production, according to their points of view (Roa *et al*., 2002).

It allows farmers to observe, test, apply, adopt and participate in the information analysis and feedback processes; and to the institutions, manage to articulate their experience, the daily contact with the crops and their ability to experiment and innovate to enrich the reports of the field work, the transfer and innovation processes, the diffusion of technologies and the results of a research project and technology transfer.

It is part of the innovative methodologies of collaborative work between producers and researchers where there is a combination of research, education, learning and action (Geilfus, 2001; Falabella, 2002; Pérez *et al*., 2002; Hellin *et al*., 2006; Cárdenas *et al*., 2010).

The experiences of CIAT, CORPOICA, the National Federation of Coffee Growers and CENICAFE are recognized at the national level; Pontificia Universidad Javeriana, the Center for Research on Sustainable Agricultural Production Systems (CIPAV), the CIER Rural Research and Extension Center of the Faculty of Agronomy of the National University of Colombia, the Corporation for the Participative and Sustainable Development of Small Farmers and UNISARC.

At the international level, the experiences of IICA (Inter-American Institute for Cooperation on Agriculture), GTZ (German Agency for Cooperation), SWISSAID (Swiss Cooperation Agency), FAO (UN), IUCN (International Union for the Conservation of Nature and Natural Resources), IDRC (International Development Research Center), the Universidad Mayor de San

Simón (AGRUCO), the Four Worlds International Institute for Indigenous Sciences, CATIE, Zamorano (Honduras), USAID (Agency of the United States for International Development), Regional Fund for Agricultural Technology FONTAGRO, Andean Program for Technological Innovation PAITEC - Andean Community, among others.

The participatory research project with farmers of blackberry no thorn (*Rubus glaucus* Benth) in the state of Risaralda used participatory research (PI) in order to know the socioeconomic and productive reality of blackberry no thorn (Rubus glaucus Benth) farmers from seven cities in the state of Risaralda and update the technological package of the crop (pests, diseases, pruning, tutored, soils, nutrition, climate), taking as a starting point the demands of the producers.

The importance of the study lay in the participation of the producers in the adjustment to the technological package of the crop through the management of participatory methodologies, which led to processes of adoption of hybrid agronomic practices, obtained from the experience of the producers and the knowledge of teachers and students, with a view to improving crop productivity; The dialogue of knowledge between producers and the academy allowed obtaining hybrid knowledge related to the cultivation very useful in the adoption of the adjustment of the technological package of the crop.

2. Materials And Methods.

Type of study

A descriptive and interpretive study that used participatory research with farmers and applied experimental research.

It was carried out in five stages: 1. Motivation, organization and agreements with the farmer researchers; 2. Establishment,

accompaniment and monitoring of the plots of experimentation and technological adjustment; 3. Situation Analysis through participatory characterization; 4. Monitoring the research plots; 5. Socialization of results.

The participatory research techniques used were: Participatory Rural Diagnosis (PRA), appraisals, direct and participant observation, interviews and semi-structured dialogues, group discussions and analysis, information output matrices, ideas for group reflection, talking maps, analysis of qualifications and scores, comparison of focus groups, workshops, semi-structured interviews, field days, participatory research plots and transects, from a research on demand scheme.

Population

328 farmers participated in the study, grouped into 40 subgroups, (which were formed in order to make teamwork by cities more viable): 8 in the city of Apia, 9 in Belen de Umbria, 6 in Guatica, 1 in Pereira, 7 in Quinchia, 6 in Santa Rosa de Cabal and 3 in Santuario.

Sampling technique

The selection of the sample was intentional for convenience, the selection criterion of the farmers was their connection to 11 associations of producers of the state of Risaralda (Table 1), of which 328 were selected and distributed as follows:

Table 1. *Producers by associations of farmers of the state of Risaralda*

Associations	City	Number or farmers
AMOROSA	Santuario	50
HORFRUBELLA	Pereira	14
AMORQUIN	Quinchia	82
COPAC - ASOMORIGUA	Guatica	68
ASMOBEL	Belen de Umbria	45
FRUTIMORA – ASOMORALCA – APROMAC - PROMERALDA	Apia	22
MUSA	Santa Rosa de Cabal	47
Total		328

Stages of The participatory research with farmers

Stage 1. Motivation, organization and agreements with farmers-researchers

In this first stage, the project was socialized with the producers, agreements were reached about the activities to be developed and visits were made to the farms where the research plots were established.

The foundations were laid for conducting research, collaborative exchange and collective construction of knowledge.

Stages 2. Situational analysis through participatory characterization

The situational analysis is presented in table 2

Table 2. *Situational Analysis Tools*

Participatory workshops	Workshop development	Workshop activities	Exit protocols or training products
- Strengths - Limitations -Opportunities - Risks	- Installation - Registry -Presentation - Feedback - Induction to the theme - Workshop closure - Exit protocols or training products	- Characterization of production systems –Matrix recognition - Prioritization of problems -Proposal of solutions	- Talking maps - Identification sheet of strengths, limitations, opportunities and risks of the crop by nucleus - Limitations weighting matrix. - Record of the approach to solutions suggested by farmers.

The situational analysis of blackberry production in the state of Risaralda was carried out through the characterization of the crop, from three types of participatory workshops:

A. Situational analysis workshops through participatory characterization
B. Workshops of Identification of cultural tasks for the blackberry crop

C. Workshops on Identification of pests and diseases vs Phenology of the blackberry crop

a. Situational analysis workshops through participatory characterization

In these workshops three activities were addressed: a) characterization of the production system, b) recognition of crop and c) prioritization of problems. For the identification of the Strengths, Limitations, Opportunities and Risks of the crop, the matrix (Table 3) and the protocols or output matrices were used in order to systematize the information:

Table 3. *Matrix: Strengths, limitations, opportunities and risks of blackberry crops in the state of Risaralda*

	Strengths, Limitations, Opportunities, Risks				
City	***Cultural***	***Social***	***Comercial***	***Environmental***	***Technical***
Apia					
Belen de Umbria					
Guatica					
Pereira					
Quinchia					
Santa Rosa de Cabal					
Santuario					

For the analysis and grouping of the Strengths, Limitations, Opportunities, Risks of the crop, a weighting matrix was used (Table 4), by means of which the producers rated each aspect according to a scale from 0 to 3, where 0 is no incidence value and 3 the tallest.

Table 4. *Strengths, Limitations, Opportunities, Risks weighting matrix*

Incidence	Value	Description
None	0	It has no impact on blackberry production system
Low	1	It has a low impact on the blackberry production system
Half	2	It has a medium impact on the blackberry production system
High	3	It has a high impact on the blackberry production system

b. Workshops of Identification of cultural tasks for the blackberry crop

Three activities were addressed in these workshops: a) feedback of the results of workshop as input behavior, b) identification of cultural tasks and c) relationship of cultural tasks with phenological stages and phytosanitary aspects (pest insects and diseases). For the identification of the cultural tasks, the identification form of cultural tasks was used for the cultivation of blackberry without thorn (Table 5).

Table 5. *Matrix of identification of cultural tasks*

Cultural work	Objective of cultural work	Tool or product used

Once the cultural tasks had been identified, the farmers related them to the phenological stages of the crop and the phytosanitary aspects (pest insects and diseases), for this the relationship matrix of cultural tasks with phenological stages and phytosanitary aspects of the crop was used (Table 6)

Table 6. *Matrix of cultural tasks vs phenological stage vs phytosanitary aspects*

Cultural work	Phenological stage in which the work is done	Time of realization	Insect or disease that appears when doing the work

The group discussion and analysis technique was used by each nucleus of producers in order to evaluate the cultural tasks, their usefulness and the tools or activities carried out.

c. Workshops on Identification of pests and diseases vs Phenology of the blackberry crop

For the identification of the pests and diseases of the crop, the environmental offer, the phenological cycle, the phytosanitary problems and their influence on the development of the plant were taken into account, as well as the climatic periods of greater prevalence and the phenology of the crop. To record the information, the identification sheet for pests and diseases and their relationship with the phenological stage (Table 7) was used.

Table 7. *Matrix of relation of insect pests and diseases with phenological stages*

Phenological stages	Pest insect	Diseases
Phenological Stage I: Sowing from seed to final site: 24 to 35 days		
Phenological Stage II: Definitive site at the beginning of flowering: 180 to 210 days		
Phenological Stage III: Start of flowering to beginning of harvest: 90 days		
Phenological Stage IV. Start of harvest until the end of the cycle.		

The nucleus of farmers established relationships between cultural tasks, phenological stages and phytosanitary aspects (pest insects or diseases); For this, they used the relationship matrix of cultural tasks with phenological stages and phytosanitary aspects (Table 8).

Table 8. *Matrix of relation of cultural tasks with phenological stages and phytosanitary aspects*

Cultural work	Phenological stage in which the work is done	Time of realization	Insect or disease that appears when doing the work

Finally, relationships were established between climatic changes and activities that favor the appearance of pests and diseases. The registration of the information was carried out by means of the identification card of the climatic changes and / or activities that favor the appearance of pests and diseases in the no thorn blackberry crop is presented in Table 9.

Table 9. *Matrix of relation of pest insect and diseases with cultivation activities and climate change.*

Climate change.	Activity in the crop	Pest Insects	Disease

Stages 3 and 4. Establishment, accompaniment and monitoring of the plots of experimentation and technological adjustment

8 demonstration plots were installed in 8 properties of blackberry farmers located in:

Quinchia, Guatica, Belen de Umbria, Santa Rosa de Cabal, Pereira, Apia and Santuario.

Stage 5: Socialization of results

The socialization of the results, both from the demonstration plots and the situational analysis of the crop, was carried out using methods such as field days and training events.

3. *Results And Discussion*

Stage 1: Motivation, organization and agreements with farmer-researchers

Meetings were held with the boards of directors of each one of the associations to organize the research process and the areas where they would be carried out, in the same way, the minutes of commitment between the institution and the co-investigating farmers were signed.

Stage 2. Situational analysis through participatory characterization

Social Cartography - Talking Maps

The first method used to characterize blackberry culture in Risaralda was Social Cartography. The producers made talking maps of their farms where they drew the productive system, the other crops and areas of the producing farms. From the analysis with social cartography, it was found that the no thorn of blackberry crop in Risaralda is 90% of peasant agriculture, it is carried out on plots of between 0.5 to 1 hectare, under the modalities of ownership, sharecropping and leasing, the 30% are tenants, the labor force is family and the tasks are classified by gender and age; one hectare produces 8.5 t / year and generates 2.5 minimum wages.

Situational Analysis Workshops through participatory characterization

For the situational analysis and characterization of the blackberry cultivation in Risaralda, 24 workshops were carried out in which 27 variables that gave rise to 63 matrices or exit protocols were analyzed. In these workshops, 19 variables were addressed in four activities: 1. Characterization of the productive systems,

2. Recognition of the Strengths, Limitations, Opportunities, Risks in the crop, 3. Prioritization of problems and 4. Proposal of solutions.

The variables addressed by the producers were:

1. Environmental offer
2. Roads of communication
3. Producer associations
4. Management of the technological package (varieties, planting distances, propagation systems, cultivation practices, pruning, tie-downs or tutored, fertilizers, pest and disease management, harvest, post-harvest)
5. Technical assistance and training
6. Commitment of associates
7. Means of transport
8. Refrigeration in the sidewalks or collection sites of the associations
9. Sustainability in price
10. Land tenure for cultivation
11. Consumer demand at the industrial and household level
12. Value to the product
13. Productive areas
14. Promising fruit 1
15. Costs in the establishment
16. Pests and diseases
17. Biosecurity
18. Planting distance
19. Tutoring systems

Identification of the strengths, limitations, opportunities and risks of the crop

The strengths, limitations, opportunities and risks of blackberry cultivation in the department of Risaralda were cataloged and analyzed based on the technical, economic, social, cultural, environmental and commercial components, thus obtaining a comprehensive analysis of all cultivated areas.

Once the strengths, limitations, opportunities and risks were grouped for each producing municipality, they were classified and analyzed taking into account the factors, resulting in a comprehensive analysis of the entire crop for the department of Risaralda:

Strengths of no thorn of blackberry crop in Risaralda

The blackberry farmers of the state of Risaralda identified and prioritized 19 strengths for the crop, the scores placed as main those related to the technical economic factor: quality of the seed and the product, cultural work and GAP, adequate use of protection kits and permitted chemical inputs, family labor, savings and revolving fund, and land tenure.

The following are those that were prioritized in the 40 nuclei of the 7 municipalities (Table 9):

Table 9. Main strengths of no thorn of blackberry crop in the department of Risaralda

Factors	Strengths
Cultural	Experience and knowledge of the crop, Family support
Social	Associations, Good organization, Commitment and sense of belonging
Commercial	Access and communication routes, Good merchandising and marketing, Packaging and packaging presentation
Economic	Family labor, Revolving and savings fund, Stable price and timely payments, Land tenure.
Environmental	Good location of the properties, adequate environmental offer for cultivation, accessibility of water and protection of water sources.
Technical-productive	Quality of the seed and the product, Cultural tasks and GAP, Proper use of permitted pesticides and use of protective equipment, Live guardians and polyculture.

Limitations in the no thorn of blackberry crop in Risaralda

The blackberry farmers in Risaralda described an average of 17 limitations for cultivation for each of the producing municipalities.

Using a quantitative scale, the percentages of the main limitations were calculated and taking into account the frequencies and weighted averages, the three main limitations were determined, namely: 1) pests and diseases, 2) inappropriate use of pesticides, and 3) infrastructure as regards to cold rooms, homes and septic tanks, these limitations are highlighted in Apía, Quinchía, Belén de Umbría and Santa Rosa de Cabal.

Some farmers expressed the opinion that: “the problem that most afflicts us and that limits us are pests and diseases, more than all the Crespera caused by the *Oidium* fungus”; "We get confused because they tell us to use this, apply this, this is forbidden and others come and tell us otherwise, then one becomes that he does not know what to believe" and "people are getting very sick from toxins"

Blackberry crop opportunities in Risaralda

The most relevant opportunities were described around the technical - productive factor in what has to do with: access to training and implementation of GAP, technical support - MADR support, processing, post-harvest management, product transformation, certifications, records cultivation, integrations between partners and the family, support from institutions and better living conditions for producers and their families; access to education, decent housing, social security and health (Table 10):

Table 10. *Opportunities for no thorn of blackberry crop in the producing areas of the department of Risaralda*

Factors	Opportunities
Cultural	Acquire better knowledge, rural opportunities and tourism.
Social	Integrations between partners and the family in cultivation, Support from different entities and institutions, Better living conditions.
Commercial	New markets and commercial alliances, Product transformation, Obtaining a good price.
Economic	Access to bank loans and aid, Strengthen the revolving and savings fund, Added value of the product.
Environmental	Improvement of water sources and environmental conservation, Diversification and reforestation.
Technical-productive	Access training and implementation of GAP, technical support and support from the MADR, processing, postharvest handling and transformation of blackberries, certifications and records for cultivation.

Risks in the blackberry crops in Risaralda

The main risks identified by farmers in Risaralda were: climatic factors that affect the crop and cause losses, low prices in marketing, high input costs and low sales prices.

In this regard, Jainer Bedoya, president of ASMOBEL stated that "to produce a kilo of blackberry they spend $ 1,200 pesos and Postobon buys it for $ 2,000 so their earnings are very low."

Workshops of identification of cultural tasks for the blackberry crop

Table 11 shows the cultural tasks identified by the blackberry farmers in the seven producing cities. With 100% of frequency the sowing and the establishment of tutored systems are presented, that is to say, all the farmers consider these tasks essential for the development of the crop; with 94% edaphic and foliar fertilization and with 90% the work of preparing the land, tracing and drowning.

Seed selection and post-harvest management were only taken into account as cultural tasks in less than 10% of the farmers. The producers stated using tools such as: machetes, *palín*, hoe, fiber, wood (tutored), pruning shears, agro-inputs such as fertilizers, herbicides, fungicides, insecticides and baskets for harvesting.

Table 11. *Cultural activities identified for blackberry farmers in the producing areas of the state of Risaralda*

Work	Percentages (%)
Sowing the seed	100
Tutored	100
Fertilization	94
Batch preparation	90
Lot plot	90
Drowned out of the lot	90
Fumigation with fungicides	89
Maintenance pruning	88,6
Formation pruning	77
Insecticide spraying	77
Harvest	77
Weed control	74
Determine the batch	56
Plateo	37
Soil disinfection	13
Post-harvest	9
Seed selection	3

The producers indicated that there are tasks that are carried out only once in the crop cycle, such as: the selection of the land, the layout and the drowning. Others, on the contrary, must be carried out repeatedly: fertilization, weed control, fumigations, pruning and harvesting; the time and number of times that the work must be carried out depends on the conditions of the crop, climate and the producer's decision.

Workshops on the identification of pests and diseases vs phenology of the blackberry crop

The blackberry farmers in the state of Risaralda reported 35 insects associated with the different phenological stages of the crop, this indicates a risk due to the increase in production costs, given the amount of controls they must carry out, in addition to the losses of the product and ignorance of the type of handling.

In general, the borers, with a high incidence in the crop, occupied the highest levels reported by the farmers for the phenological stages. It should be clarified that when referring to the borers, both the stem and the neck of the plant are covered; According to Betancourt *et al.,* (2014), these insects involve severe damage since they pierce and penetrate the plant organ leaving excrement in its wake, as it progresses, wilting and subsequent drying is observed from the apex towards the base of affected branches.

Regarding the climatic period, the farmers reported that 22 of the 35 pests appear in warm periods with percentages equal to or greater than 50% in all phenological stages; they are: red spider mite, mites, prodiplosis, rooks, mosquito and yellow mosquito with a 100% prevalence.

In the rainy season, 6 pests are reported (slugs, virgin's burrita, foliage eaters, fruit flies, weevils and chrysomelids) with perceptions of the farmers higher than 50%. It was found that there are seven pests in all climatic periods, of these, chizas, suckers, choppers, whiteflies and parrots with a reference of 100% of the blackberry producers of the department.

The farmers mention that they control 83% of the pests using insecticides, however, they alternate with other methods such as: cultural work, soil treatments, weed management, biological baits,

among others; For the rest of the pests, baits (slugs), acaricides (mites and spider mites), scarecrows (parrots), cultural tasks (chrysomelids) are used in 100%.

Diseases vs Crop phenology

The blackberry farmers in the state of Risaralda identify 18 diseases in the different phenological stages of the crop, however, Crespera, Antracnosis, Peronospora and Botrytis are mentioned as the most common and with the highest incidence in all the phenological stages of the crop; With the exception of Botrytis, since this disease begins its appearance in flowering. Other diseases reported by the producers were: Fusarium, Phythoptora, Nematodes, Gray spot, Virosis, hereditary malformations, Descending death, Rust, Verticillium, Alternaria and Rosellinia, with appreciations lower than 20% of the producers.

The farmers stated that 3 of the 18 reported diseases occur in all climatic periods, 15 are reported by more than 50% of the producers in the rainy period: *Fusarium*, fungal complex, sores, gray spot, mildew, descending death and *Verticillium*, therefore, the control or management is carried out in these stages.

Farmers reported that they use fungicides to control 13 of the 18 diseases reported for the crop, of these 57% (8 diseases) are alternated with other management such as pruning, timely collection of fruit and weed management, among other tasks. For the control of nematodes, 100% of the producers use nematicides, in the same way, 100% of them mention that they control Virosis and eliminate the plant to control descending death.

Conclusions.

Participatory research with farmers turned out to be a useful and versatile strategy for conducting research on demand. The exchange and collaboration with the farmers allowed not only to

know the reality of the blackberry crops in its different dimensions, but also to carry out field trials with research plots.

The knowledge of the farmers about the cultivation of blackberry allowed them to be the ones who characterized it and realized how they are managing it with its strengths and weaknesses; An account of this was also the identification of the main cultural tasks, pests and diseases of the blackberry and its relationship with the phenological stages and climatic period.

The participatory research tools are multiple and varied, as are the participation scales; In this case, the participation was functional and for incentives, as the producers not only participated in the workshops, but also assumed functions in the plots with responsibilities in aspects related to the installation of the same, the appropriate propagation methods, maintenance , the data collection and the socialization of the results; This led to a high degree of interest from producers in the process, which led to the adoption of new elements of the technological package of no thorn blackberry crops in the state of Risaralda.

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